

DYNAMIC FUEL PROCESSOR
MECHANIZATION AND CONTROL

ABSTRACT OF THE DISCLOSURE

A fuel processor control system for a fuel cell stack includes water and fuel metering devices that control water and fuel provided to the fuel processor. An air flow rate sensor generates an air flow rate signal based on air flowing from a compressor to the fuel processor. A valve is located between the fuel processor and the fuel cell stack. A controller controls the valve and the water and fuel metering devices based on the air flow rate sensor. Other feedback signals such as stack voltage, stack cell voltage variation, pressure differential across the valve, and mass flow rate between the valve and the fuel cell stack can augment or be substituted for the air flow rate feedback signal. The fuel processor can be a partial oxidation reformer a steam reforming reactor, an auto thermal reformer or any combination thereof. The system may also include a water as shift reactor and a preferential oxidation reactor for carbon monoxide reduction.